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Eyewitness memory: effects of sadness and anger on recall

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EYEWITNESS MEMORY:

EFFECTS OF SADNESS AND ANGER ON RECALL

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Abstract

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To date, little research has focused on the effects of emotion on eyewitness memory. The present study extended the research of Franklin (1985) by investigating whether the resource allocation model (Ellis & Ashbrook, 1988) applied to moods other than sadness, when induced after the viewing of an eyewitness event. Specifically examined was the effect of anger and sadness on memory for the event. Participants watched a videotaped event followed by a randomly assigned mood induction video (sad, angry, neutral) and then completed a questionnaire evaluating their memory for the event. To ensure that the induced mood lasted through the study, a mood questionnaire was repeatedly employed. Participants in the sad and angry conditions were expected to have poorer recall than those in the neutral condition due to the limited cognitive capacity caused by varying states of arousal. Results failed to support the hypotheses. Future implications are discussed.

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TABLE OF CONTENTS

LIST OF TABLES

TABLE PAGE

LIST OF FIGURES

FIGURE PAGE

Running Head: EYEWITNESS MEMORY: EFFECTS OF SADNESS AND ANGER

EYEWITNESS MEMORY:

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To date, little research has focused on the effects of emotion on eyewitness memory. The present study extended the research of Franklin (1985) by investigating whether the resource allocation model (Ellis & Ashbrook, 1988) applied to moods other than sadness, when induced after the viewing of an eyewitness event. Specifically examined was the effect of anger and sadness on memory for the event. Participants watched a videotaped event followed by a randomly assigned mood induction video (sad, angry, neutral) and then completed a questionnaire evaluating their memory for the event. To ensure that the induced mood lasted through the study, a mood questionnaire was repeatedly employed. Participants in the sad and angry conditions were expected to have poorer recall than those in the neutral condition due to the limited cognitive capacity caused by varying states of arousal. Results partially supported the hypothesis. Future implications are discussed.

Eyewitness Memory:

Effects of Sadness and Anger on Recall

Eyewitness memory is often considered the most crucial element of evidence for the prosecution in a criminal case. Because of this, eyewitness testimony is frequently unfairly weighted in deciding the verdict. Although it has become common practice to give eyewitness testimony this significance, in reality many aspects can affect the accuracy of an eyewitness' memory for an event, making this information very susceptible to outside influences (Loftus, 1979; Loftus, Miller, & Burns, 1978). These instances may include police questioning and/or interrogations, media coverage, repeatedly recounting the details of the event to others, as well as mood states. These influences can present misleading information, which may contaminate the witness' memory of the event (Loftus & Hoffman, 1989). Due to the fragility of eyewitness memory yet the considerable credence given to it by the judicial process, it is important to identify the factors that may distort these memories and identify ways to counteract them. In addition, if cognitive processing modifiers such as mood, which often occur after witnessing an upsetting incident, can affect eyewitness recall, these effects need to be examined. Such findings could have great implications for the validity of eyewitness testimony in the courtroom.

Moods and Eyewitness Memory

Due to the current pertinence given to eyewitness memory and all of the possible factors that may affect an eyewitness' account of an event, research examining how these factors influence one another is essential. Findings from this type of research may

provide insight into which factors, as well as combinations of factors, most greatly influence memory for an event. There has been a great deal of criticism concerning this type of research based on the common belief that results found in laboratory settings are not applicable to real-life situations, mainly due to the lack of realism displayed in experimental conditions (Maass, 1996). Furthermore, the unlikelihood of an experimental situation actually happening in real life, and the usefulness of experimental research to actual forensic investigations, are two important factors lacking from many of the controlled laboratory studies dealing with witness memory. Despite these limitations, many facets of eyewitness memory continue to be explored.

One notable area of interest in research on eyewitness memory is the effect of mood on cognitive processing and the manner in which these mood states affect eyewitness memory. Emotions have long been believed to influence memory (Bower, 1981; Ellis, Thomas, McFarland, & Lane, 1985; Levine & Burgess, 1997; Williams, Watts, MacLeod, & Mathews, 1988). For instance, Bower (1981) believes that emotions play an important role in memory and other cognitive processes, and proposed that each separate emotion has a specific node to which memories related to that particular emotion are tied by an associative network. Consistent with his assertions, Bower did indeed find an association between induced moods and state-dependent memory (improved remembering while in the same emotional state as when information was first encoded) for personal and childhood experiences. This was done through hypnotizing participants and inducing moods (happy or sad) by asking participants to imagine or remember a scene that involved an emotion synonymous to that being induced. Previously

participants had recorded personal emotional experiences in a daily diary for a week, and so were then asked to recall as many of these incidents as possible while in the induced mood state. This lends support to the theory that emotions do have an effect on memory.

Since many eyewitness situations involve surprising or upsetting circumstances, it is reasonable to suggest that the emotions most frequently generated by these incidents, such as sadness, anger, fear, and anxiety, have an effect on memory for the event. For example, if a person is in a particular mood and then witnesses an event, it is possible that the mood may either inhibit or aid recall of the event. The same may be true for a person who witnesses an event and consequently experiences a particular mood.

To date, much research on emotion and memory has focused on the effects of a generalized negative arousal on memory (Bekerian & Goodrich, 1999, p. 789), and has not paid attention to the effects of specific emotions such as fear and anger on memory. This may primarily be due to the difficulty, if not impossibility, of inducing extreme fear, arousal or threat of personal injury in a participant, conditions similar to those experienced during a real-life eyewitness event, while adhering to the ethical limitations of research. Even so, if this obstacle could be removed, more could be discovered regarding the effects of other emotions on memory. One objective of the current study, then, is to attempt to remove this obstacle and examine the effects of anger and sadness on memory.

Sadness, Anger, and Arousal

Anger has been described by Ortony, Clore, and Collins (as cited in Berkowitz, 1999) as including both disapproval of someone's conduct as well as annoyance toward

the occurrence of the event. Sadness, on the other hand, requires an appraisal of loss or failure for either one's self or a significant other (Power, 1999). These two emotions, therefore, by definition, are quite distinct from one another.

Discussing the physiological effects of emotion, Bodenhausen (1993) stated that according to biological evidence, anger and anxiety/fear, while distinct from each other, are quite physiologically similar. Yet both of these emotions are quite physiologically different from sadness. It seems that anger and sadness involve different parts of the brain, elicit opposite neuroendocrine responses, and demonstrate different arousal levels. Hence, it seems that anger and sadness are different by definition as well as physiologically.

Eyewitness events are often created because after a crime or accident occurs, by-stander reports are needed to piece together what happened. Arousal can be an important ingredient in eyewitness situations because many of these types of events create an arousal response within the viewer. Such a response is likely to affect the accuracy of the eyewitness report. Because several different emotions seem to have different effects on memory, and emotions are defined, at least in part, by distinct levels of arousal, it seems reasonable to conclude that differing levels of arousal play some part in the effects emotions have on memory. For this reason, different levels of arousal were an important criterion for choosing the two emotions to investigate for the present study.

When examining arousal, the Yerkes-Dodson (Yerkes & Dodson, 1908) law and the Easterbrook (Easterbrook, 1959) hypothesis are the two most relevant theories. Both theories have also been used in the literature to explain recall regarding eyewitness

memory. The Yerkes-Dodson law follows an inverted-U shape and represents the performance level of a task as one's arousal level increases. As arousal increases, performance will increase until an optimal level of performance is obtained. If arousal continues to increase beyond this point, performance level will begin to deteriorate, due to a lack of focus caused by over-stimulation. With respect to sadness and anger, this theory suggests that recall performance would be based on the corresponding arousal level, and therefore anger would exhibit the worst recall of the two emotions due to its higher arousal level. Regarding eyewitness memory, several researchers (e.g., Christianson, 1992; Egeth, 1994) argue that the Yerkes-Dodson law is an oversimplification used to account for the single factor of arousal without taking into account other cognitive and emotional factors.

The Easterbrook (1959) hypothesis is similar to the Yerkes-Dodson (1908) law except that it discusses arousal in terms of "cue utilization" or, in other words, using the necessary environmental cues to perform a specific task (Egeth, 1994). According to this hypothesis, as cue utilization becomes more specific, performance improves, until even relevant cues cannot be used, and performance begins to deteriorate. Therefore, this model states that the more complex the task, the lower the arousal level needed for optimal performance to occur (Egeth, 1994). Applying this to eyewitness memory, which is usually considered a relatively complex task, an arousal level needs to remain low for more accurate details to be recalled. This is extremely unlikely in most eyewitness situations. Consequently, according to this theory, in an eyewitness situation recall can be expected to be poor. Furthermore, with regard to sadness and anger, anger

again would be expected to most greatly diminish recall performance due to its higher arousal level.

Despite these theories, researchers have found many divergent results involving recall. For example, Yuille and Cutshall (as cited in Egeth, 1994) and Hosch and Bothwell (as cited in Egeth, 1994) found that higher arousal was correlated with more accurate recall, implying no decrement in recall at extreme arousal levels. These results, therefore, do not follow either the Yerkes-Dodson (1908) law or Easterbrook (1959) hypothesis, and suggest that sadness to some extent, and anger to a greater extent, would improve recall due to their corresponding arousal levels. Contrary findings were observed by Hollin (1984) and Peters (1988), both finding that when participants were most aroused, their accuracy as eyewitnesses declined. These findings tentatively support an arousal hypothesis such as the Yerkes-Dodson law or Easterbrook hypothesis.

Hence, as demonstrated by the conflicting findings regarding arousal and memory, it might be possible that neither the Yerkes-Dodson (1908) law nor the Easterbrook (1959) hypothesis retain a relevant application toward eyewitness memory. It seems that eyewitness memory may be more complex than these theories allow for. Therefore, a different model that allows for a more inclusive analysis of eyewitness memory, arousal, and emotion is needed. Furthermore, although research findings regarding arousal and recall are contradictory, findings regarding the affect of sadness and anger on recall are also inconsistent. A brief discussion follows.

Effects of Sadness and Anger on Information Processing

Of the negative emotions discussed previously, the majority of research involving emotion and memory has focused on sadness. Nonetheless, the effects of sadness on memory have been diverse, creating a need for further examination. Past research has shown that inducing a sad mood can either cause participants to process information more carefully (Bless, Bohner, Schwarz, & Strack, 1990; Hildebrand-Saints & Weary, 1989) or can decrease the level of information processing (Asuncion & Lam, 1995; Ellis & Ashbrook, 1988; Ellis & Moore, 1999).

Previous findings have used one of two different approaches, motivational or cognitive, to interpret their results. For instance, it has previously been argued (Bless, et al., 1990; Hildebrand-Saints & Weary, 1989) that an increase in careful processing may be due to motivational goals on the part of participants, causing employment of a higher level of processing. For instance, being in a negative mood, such as sadness or anger, may warn a person that there is something wrong in his or her current environment, generating a need for more elaborate processing in an attempt to rectify the situation. Another possibility is that being in a negative mood, may cause a person to engage in careful processing of favorable information in an effort to reverse his or her mood state. Both situations require the need for more elaborate processing. According to this approach, if a person is in a negative mood, therefore processing information more elaborately, and witnesses an eyewitness event, he or she would recall more details from the event than would otherwise be expected had this person not been processing information as elaborately.

On the contrary, the decrease of information processing found by some research (Asuncion & Lam, 1995; Ellis & Ashbrook, 1988) has been argued to be due to a limitation in available cognitive processing resources caused, primarily, by a preoccupation with the sad mood. This limited capacity does not allow one to exert the level of cognitive effort necessary for elaborate processing of information to occur, causing memory performance to be poor. Hence, if an event were to be witnessed in this state, poorer recall of the event details would result. Previously, most research has investigated these effects as they apply to sadness. Anger, because of its high arousal level, should also deplete cognitive processing resources.

When discussing anger, research examining its effects on memory is much more limited. This is most likely due to the fact that anger is a more difficult mood to induce in the laboratory. Nonetheless, the existing research has demonstrated that different emotions have different effects on memory (Keltner, Ellsworth, & Edwards, 1993; Levine & Burgess, 1997). It seems that although both sadness and anger, often caused by awareness of a problem and consequently initiating a need for problem-solving, may cause limitations in cognitive processing capacity due to increased information processing, the focus of a person's attention varies depending on the mood. When both sad and angry individuals recalled information from a narrative, angry individuals tended to recall more information regarding goals, whereas individuals feeling sadness tended to focus more on information concerning event outcomes (Levine & Burgess, 1997; Power, 1999). Likewise, when presented with a new situation with several possible interpretations, angry individuals tend to focus on other people's intentions, while sad

individuals tend to focus on external situational causes. For example, if a person misses an important flight, an angry person is more apt to feel this was caused by a terrible cab driver, while the sad person attributes it to bad traffic. In other words, angry people are more likely to feel that someone else caused the situation while sad people are more likely to feel that an outside, uncontrollable factor caused the situation (Keltner, et al., 1993).

To date, research regarding mood and information processing has been conflicting and limited. Studies examining sadness have mainly focused on the motivational and cognitive approaches toward interpreting information processing effects, whereas research examining anger has dealt more with attribution and not with recall. Because the limiting effects of anger are unknown, we chose to examine anger along with sadness. A study by Franklin (1985) is relevant to the present study, because it also deals with eyewitness memory and cognitive processing effects. Based on Franklin's study, the present study will similarly employ the cognitive approach. Furthermore, while elaborate processing might increase under some circumstances, we believe that with eyewitness memory this will not be the case due to the amount of cognitive capacity consumed by arousal and interference. This is consistent with the cognitive model used by the Franklin study, the resource allocation model, and thus the same model will be applied to the current study.

Resource Allocation Model

The resource allocation model (Ellis & Ashbrook, 1988) examines both emotion and the level of cognitive effort necessary for the completion of a memory task. This model

presents a better method than either the Yerkes-Dodson (1908) law or the Easterbrook (1959) hypothesis to examine arousal because (a) the Yerkes-Dodson law and Easterbrook hypothesis models look solely at arousal, and (b) the resource allocation model not only investigates different levels of arousal, but also explores the relationship between different emotions and memory performance.

Previous research by Ellis et al. (1985) examined whether or not a depressed mood affects output or retrieval from episodic memory. Up to this point, research had been focused more on encoding effects, with not much work done in the area of retrieval effects. They found that depressed participants displayed a reduction in recall, providing evidence for mood state effects on retrieval. Consequently, Ellis et al. (1985) proposed that emotional states may act as regulators of attention available for cognitive tasks.

Assuming that Ellis et al.'s (1985) assertion regarding emotional states applies to capacity limitation for output of information, it is possible that it can also provide an explanation for mood effects on retrieval. Therefore, Ellis and Ashbrook (1988) proposed the resource allocation model to explain the effects of mood on memory, specifically that of "disruptive emotional states (p. 25)." Their model has three main assumptions. The first assumption states that a sad mood uses up some of the available cognitive processing capacity by causing one to dwell on his or her sadness, therefore providing less mental processing capacity for other tasks. The second assumption maintains that some sort of allocation of processing capacity or cognitive effort is necessary for encoding of information, and therefore memory, to occur. The third assumption states that as more cognitive effort is allocated to the task, memory

performance improves. This also works in the opposite direction; as less cognitive effort is allocated to the task, memory performance deteriorates.

This model has important implications for eyewitness memory research. According to Ellis and Ashbrook (1988), in stressful, depressing, or highly arousing situations, there is substantial evidence that reallocation of attentional capacity takes place. In other words, some of the attention that otherwise would be used to encode information about the situation is used instead to process information regarding the mood. This, therefore, allows less attention, or cognitive effort, to be available for encoding information about the situation. Because eyewitness memory often is related to a stressful situation, and therefore may incorporate similar conditions such as those causing reallocation of attentional capacity, it is quite possible that the assumptions of the resource allocation model also apply to eyewitness memory.

Several studies have provided evidence for the resource allocation model by demonstrating that different emotions affect memory differently (Bekerian & Goodrich, 1999; Bodenhausen, 1993; Keltner, et al., 1993; Levine & Burgess, 1997). Furthermore, Franklin (1985) has looked at the effects of sadness on eyewitness memory as they apply to the resource allocation model. The eyewitness event was presented in a slide show format, followed by a mood induction (neutral or depressed). In the 'neutral' condition no mood induction was performed, and in the 'depressed' condition a sad mood induction was performed using the Velten (1968) procedure, which entails having the participant read emotion-driven statements out loud in an attempt to feel the intended emotion. This was followed by a questionnaire about the witnessed event, consisting of two conditions,

'no info' and 'misleading info.' In the 'misleading info' condition a questionnaire about the previously viewed event was given containing misleading information via Question 17 which stated, "Did another car pass the red Datsun while it was stopped at the yield sign?" Since participants actually saw a stop sign in this slide and not a yield sign, this information was incorrect and introduced misleading information to the participants. In the 'no info' condition no misleading information was presented, hence Question 17 stated, "Was the woman sitting against the lamppost reading?" and did not mention the sign. The variation in Question 17 was the only difference in the questionnaire presented to the two conditions. Finally, a recognition test was given consisting of pairs of slides in a forced-choice format. One slide had been previously viewed, and the other had not. The hypothesis was that the misleading information in the questionnaire would have a greater effect on the depressed mood group than on the control group. This would be attributed to the induced mood causing fewer cognitive resources to be available for retrieval of information related to the eyewitness event, and the interference caused by the misleading information triggering a need for a greater allocation of processing capacity to this task. Recall was measured by using a 20-item questionnaire and a 7-set slide recognition task. Consistent with resource allocation views, results supported the resource allocation model's assumptions that a depressed-mood state affects the amount of processing capacity available for allocation to a task, and that memory performance improves with the increasing amount of cognitive effort given to a task. In this case, the depressed-mood state tied up some of the resource capacity so that there was less capacity available for the task, and the misleading information caused a greater cognitive

effort to be needed in order for the task to be completed. Due to limited available cognitive capacity, and yet a demand for increased cognitive effort, a deficit in performance was observed.

However, Franklin's (1985) study has several limitations. The first limitation is the use of the Velten (1968) procedure as a mood induction technique. Although this is the most commonly used method of mood induction, the validity of this measure has often been questioned (Ucros, 1989). This particular mood induction method requires participants to read emotion-driven statements out loud in an attempt to get the participant to feel the intended emotion. Reading several statements of this type may cause the participant to guess the true purpose of this exercise, introducing demand characteristics (Buchwald, et al., as cited in Ucros, 1989; Clark, Polivy & Doyle, as cited in Ucros, 1989; Riskind & Rholes, as cited in Ucros, 1989). Reading statements out loud also creates a situation where group participation is not feasible. The use of earphones (Franklin, 1985) does not rectify this problem, because it is necessary for participants to hear themselves in order for the Velten procedure to work. Finally, there is some concern that the self-criticism component of the statements that are read aloud is not true to the emotion of sadness, and therefore, the Velten procedure is not truly inducing a state of sadness (Power, 1999). For these reasons, the Velten procedure was not employed for the present study.

Other forms of mood induction that have been used in previous research include hypnosis, facial expression manipulation, music, and remembering or writing about personal past experiences that elicited the desired emotion (Ucros, 1989; Gross &

Levenson, 1995). Although all of these methods have been demonstrated to induce moods in a research setting, a more realistic method for an eyewitness situation was sought. In the present study, a filmed mood induction was used for several reasons. First, it is applied in a visual format, more like what might naturally occur in an eyewitness situation. Second, the reliability of using film clips to evoke a mood has previously been established (Gross & Levenson, 1995; Ucros, 1989; Bross, Craighead, & Craighead, 1999).

The second limitation of the Franklin (1985) study is the use of the Depression Adjective Checklist (DACL) to assess the effectiveness of the mood induction. This method requires participants to read a list of adjectives and circle any adjective that describe how they feel at the moment. Again, this has the possibility of suggesting the true purpose of the test, the assessment of mood, and creating demand characteristics.

The third limitation applies to the use of slides for presentation of the eyewitness event. This approach, while a visual format, is not very realistic, and therefore may not use the same encoding processes as true eyewitness events.

The Purpose and Hypotheses of the Present Study

Based on previous findings (Franklin, 1985), the current study evaluated whether the resource allocation model applies to emotions other than sadness in an eyewitness memory scenario. Specifically, it examined whether anger would have an effect on processing capacity similar to that of sadness in the Franklin study. The present study also addressed the above limitations regarding Franklin's study. In order to accomplish

this, the same basic procedure as Franklin was used, although several experimental changes were employed.

For instance, a video of an event was used instead of slides in order to present a more realistic eyewitness event. Of importance to the study is that an anger mood induction was used along with a sad mood induction. Videotaped mood inductions were utilized instead of the Velten (1968) procedure. This form of mood induction takes less time to employ, is much less subject to demand characteristics, and much easier to explain to participants without giving away the main purpose of the study.

The Depression Adjective Checklist (DACL) was replaced by several visual analog scales in an attempt to measure mood accurately yet discretely. Misleading information was not incorporated with the hope that the eyewitness event would be complex enough by itself to produce an interference result. In a true eyewitness situation, a recognition test would not be possible, and thus it was not included in the present study. Nevertheless, an investigation of such an event would often rely on several types of recall on the part of eyewitnesses. This is depicted by the variety of questions commonly asked by police (e.g., "What did the suspect look like?" "Did the suspect have a weapon?", and "What happened?"). To address this, tests of cued-recall, recognition-recall, and free-recall were included in this study.

Therefore, the hypothesis being investigated was that recall (cued, recognition, and free) of details regarding the eyewitness event would be lower in the sad group than in the neutral group, and lower in the angry group than in the sad group, due to the limited cognitive capacity caused by varying states of arousal and interference. These findings

would lend further support to the resource allocation model as it pertains to other moods besides sadness, as well as to eyewitness memory.

Method

Participants

Seventy-eight introductory psychology college students at San Jose State University received partial course credit for their participation in the study. Participants came from diverse racial and ethnic groups; 44% Asian (n = 34), 23% White/Caucasian (n = 18), 9% Pacific Islander (n = 7), 9% Mexican American (n = 7), 5% Hispanic (n = 4), 1% Black/African American (n = 1), 1% Middle Eastern (n = 1), and 8% Other (n = 6). Fifty one percent (n = 40) of the participants were women. While 89% of participants had never testified as an eyewitness to a crime or accident before, 63% had never been a victim of a crime. Participants' ages ranged from 18 to 27 years old (Mdn = 19). Participants were randomly assigned to one of three different experimental conditions (angry, sad, or neutral mood) between-subjects design. Participants were tested in groups of up to ten at a time.

Materials

Eyewitness event video. A short film lasting approximately three and a half minutes depicting an eyewitness event was shown to participants. This film was created by the researcher and consists of the theft of a purse occurring in a park.

Mood induction videos. Three different mood induction videos were used. The first video, which was used in the sadness mood induction condition, is a clip from the movie "Where the Red Fern Grows" (Dayton & Tokar, 1974) and depicts a boy's two dogs

dying. The second video, which was used in the angry mood induction, is a clip from the movie "A Few Good Men" (Brown & Reiner, 1993) and depicts the questioning of a Colonel during a military trial. The third video, which was used in the neutral mood induction condition, consists of a clip from a film on proper horse safety (Holborn, 1982). In addition to the three mood induction tapes, a debrief video was also shown in an effort to reduce or eliminate any left over effects from the mood induction tapes. This video consists of a clip from the movie "Shrek" (Warner, Williams, Katzenberg, Adamson, & Jenson, 2001) and depicts numerous cartoon characters dancing and singing. The sad, angry, neutral mood induction videos, as well as the debrief video, were pre-tested on participants from the same population as that used for the present study.

Mood manipulation checks. Self-rating scales were used as manipulation checks for several reasons; they are very quick to perform, are very inexpensive to employ, problems with inter-rater reliability are eliminated and reliability is simplified (Marsella, Hirschfeld, & Katz, 1987), and they are easy to administer in a group setting. In particular, Visual Analogue Scales (Aitken, 1969) were used as manipulation checks to determine whether the mood inductions were successful. Visual Analogue Scales (VAS) were chosen because of their brevity and ease of administration and scoring (Killgore, 1999; Cella & Perry, 1986; Maruff, et al., 1994). These are important factors, considering that multiple manipulation checks needed to be applied throughout the study to ensure that the mood induction remained successful. The validity and reliability of VAS have been previously established (Luria, 1975).

Each VAS consisted of a 100 mm line anchored at both ends by opposing emotional states (McCormack, Horne, & Sheather, 1988; Brosse, Craighead, & Craighead, 1999). Two VAS asking, "how sad do you feel right now?" and "how blue do you feel right now?" were used to measure sadness (pre-questionnaire index $\underline{r} = .69$, post-questionnaire index $\underline{r} = 54$). The "sad" mood check scale was anchored by *not at all sad* and *very sad* and the "blue" mood check scale was anchored by *not at all blue* and *very blue*. Two VAS asking, "how angry do you feel right now?" and "how mad do you feel right now?" were used to measure anger (pre-questionnaire index $\underline{r} = .69$, post-questionnaire index $\underline{r} = .85$). The "angry" mood check scale was anchored by *not at all angry* and *very angry* and the "mad" mood check scale was anchored by *not at all mad* and *very mad*. Filler VAS asking questions about the last video seen were also included in order to keep participants from knowing that the purpose of the questionnaire was to measure mood. All three mood conditions received the same mood scale questionnaire to ensure that the target mood was the only elevated mood for each group.

Recall. Recall was measured in three different ways. First, following the mood manipulation check, a cued-recall test was given. This consisted of a questionnaire with 17 open-ended questions, to maintain the similarity to a real eyewitness situation, such as "What color was the thief's shirt?" Participants filled in the blank immediately following each question with their response. Scores equaled the total number of correct items recalled by each participant. Next, was a recognition-recall test in the form of 18 questions that could be answered either by circling "yes" or "no." Again, scores represented the total number of correct items the participant recalled. Finally, a free-

recall test was given by asking participants to write down anything else they could remember (in essay format). Scores were computed by counting the number of other items the participant listed (The entire questionnaire can be found in Appendix B).

Procedure

Participants were randomly assigned to one of three experimental conditions comprised of three mood conditions (angry, sad, or neutral). Participants were then told that the purpose of this study was to help evaluate some films showing social interactions and perceptions for use in future studies. In reality, the participants were shown the eyewitness event tape, for which participants were later asked to complete a recall test questionnaire, followed by a tape for the assigned mood induction condition. The neutral mood induction consisted of watching a 4 minute, 48 second video on proper horse safety (Holborn, 1982). The sad mood induction consisted of watching a 5 minute, 45 second video clip from the film "Where the Red Fern Grows" (Dayton & Tokar, 1974), showing the scene where a boy's two dogs die. The angry mood induction consisted of watching a 4 minute, 24 second video clip from the film "A Few Good Men" (Brown & Reiner, 1993) showing the questioning of a Colonel during a military trial.

Immediately following the conclusion of the mood induction tape, all participants were asked to complete a mood questionnaire comprised of VAS to insure that the intended mood was successfully induced. The success of the intended mood induction was determined by checking with the corresponding VAS, while the other mood-related VAS acted as controls for the intended mood. Filler VAS asking questions about the last

video seen were used to camouflage the true purpose of the questionnaire, mood measurement.

All participants were then administered a Recall test consisting of open-ended questions, yes/no questions, and a blank section where they were asked to write down anything else they could remember regarding the eyewitness event they had just viewed.

Following the recall test, a demographic questionnaire was administered. At the end of this questionnaire the mood questionnaire was administered again to ensure that the mood induction had endured throughout the study. Participants were then debriefed. As part of the debriefing, all participants viewed a happy mood induction tape in an effort to minimize the effects of the negative mood inductions. This consisted of watching an approximately 2 minute, 30 second video clip from the film "Shrek" (Warner et al., 2001) showing various cartoon characters singing. The researcher also provided each participant with a written debriefing statement explaining the true purpose of the study. In the event that any participants were still feeling negatively, counseling information was included with the written debriefing statement. All participants were then thanked and dismissed.

Results

Effectiveness of Mood Manipulation

The mood manipulation produced significant results. Mood was measured immediately following the mood induction video and again following the administration of the eyewitness questionnaire. Participants' responses to the two items assessing sadness ("How sad do you feel right now?" and "How blue do you feel right now?") were

averaged to form a single index for sadness, and responses to the two items assessing anger ("How angry do you feel right now?" and "How mad do you feel right now?") were averaged to form a single index for anger. Participant scores for both the sadness and anger indices each ranged from 0 to 100. Both mood measures were averaged in this manner, creating a before-questionnaire ($r = .69$) and after-questionnaire ($r = .54$) measure of sadness and a before-questionnaire ($r = .69$) and after-questionnaire ($r = .85$) measure of anger. All four indices were analyzed separately using one-way analysis of variances (ANOVA), with the independent variables for all of these analyses being the different mood conditions (sad, angry, and neutral).

Regarding the pre-questionnaire sadness index, administered immediately following the mood induction video, results indicated that participants who watched the sad videotape reported feeling sadder ($M = 47.65$, $SD = 23.46$) than participants who watched the neutral videotape ($M = 18.20$, $SD = 17.01$) and participants who watched the angry videotape ($M = 34.69$, $SD = 15.57$), $F(2, 77) = 16.91$, $p < .001$ (see Figure 1). Regarding the pre-questionnaire anger index, also administered immediately following the mood induction video, participants who watched the angry videotape reported feeling angrier ($M = 48.43$, $SD = 12.42$) than participants who watched the neutral videotape ($M = 16.98$, $SD = 18.34$) and participants who watched the sad videotape ($M = 34.54$, $SD = 22.20$), $F(2,77) = 18.40$, $p < .001$.

Planned comparisons indicated that, regarding the pre-questionnaire sadness index, sad mood participants differed significantly from neutral mood participants ($p < .001$), as well as from angry mood participants ($p < .05$). Planned comparisons indicated that

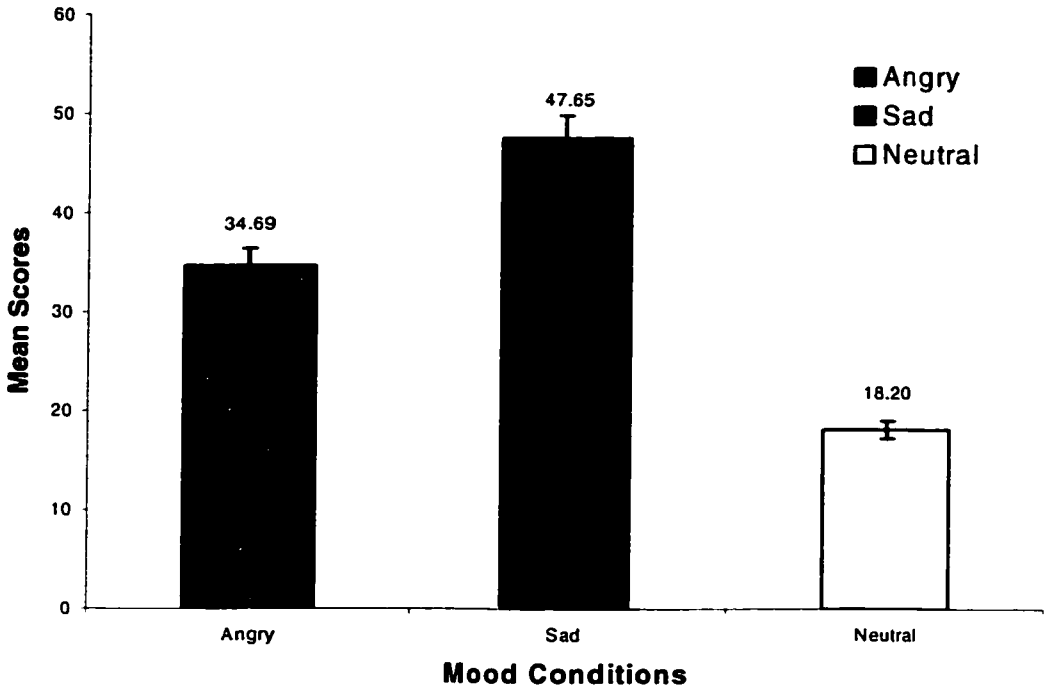

Figure 1. Pre-Questionnaire Sad Mood Index Means for Angry (n = 21), Sad (n = 27), and Neutral (n = 30) Mood Conditions.

angry mood participants differed significantly from neutral mood participants ($p < .001$) as well as from sad mood participants ($p < .05$), demonstrating that the angry mood videotape produced results distinct from the other mood videotapes (see Figure 2). Thus, presentation of the videotapes was successful in inducing neutral, sad, and angry mood states.

Tests of hypothesis

The hypothesis was tested using ANOVA planned comparisons.

Cued-recall

It was hypothesized that participants in the neutral mood condition would accurately recall the most items, followed by those in the sad mood condition, and finally those in the angry mood condition. Cued-recall was analyzed using a one-way ANOVA, with the three mood conditions (sad, angry, and neutral) as the independent variables. There was no main effect between the different mood states relating to the number of correct cued-recall items, $F(2, 77) = .02$, $p = .98$. People with a neutral mood ($M = 9.20$, $SD = 1.88$), people with a sad mood ($M = 9.11$, $SD = 1.58$), and people with an angry mood ($M = 9.19$, $SD = 1.89$) did not differ on the number of correct cued-recall items. Thus, different mood conditions had no effect on cued-recall for the eyewitness event.

Recognition-recall

Again, it was hypothesized that participants in the neutral mood condition would have the greatest recall, those in the sad mood condition would have decreased recall, and those in angry mood condition would have the most diminished recall.

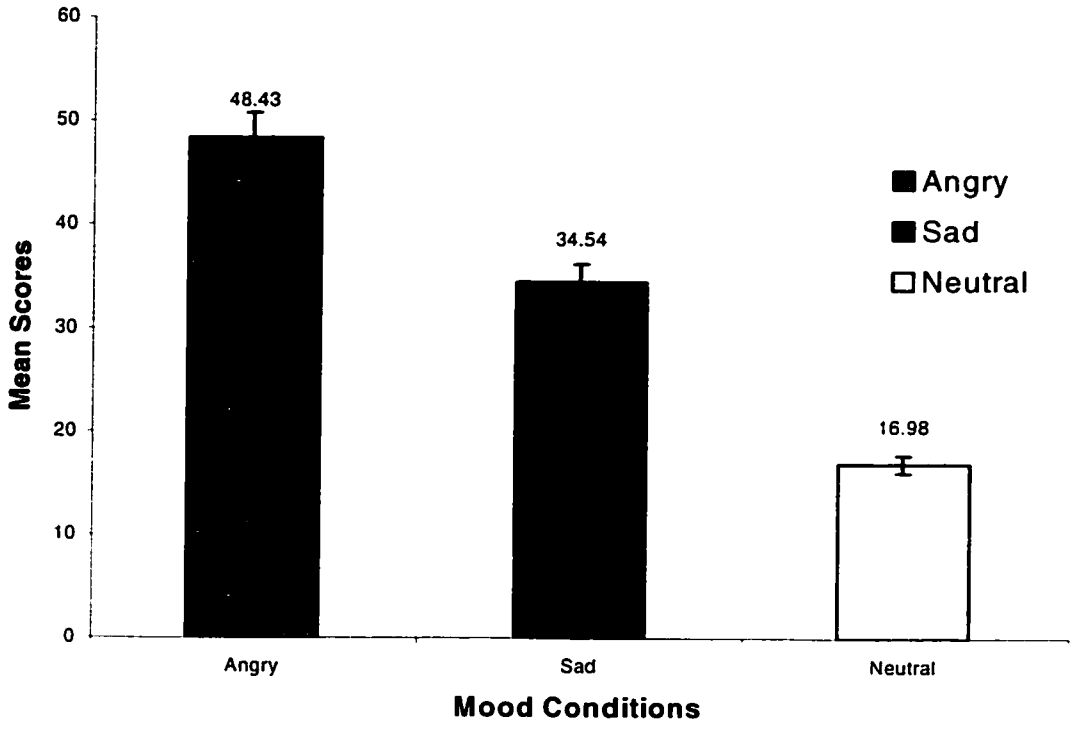

Figure 2. Pre-Questionnaire Angry Mood Index Means for Angry (n = 21), Sad (n = 27), and Neutral (n = 30) Mood Conditions.

Results indicated that there was a significant main effect for the number of correct recognition-recall items, F (2, 77) = 5.48, $p < .01$, demonstrating an effect of mood condition on accurate recognition-recall ability. Planned comparisons showed that angry mood participants (M = 12.90, SD = 1.26) recalled significantly fewer items than neutral mood participants (M = 14.17, SD = 1.86, $p < .01$) and sad mood participants (M = 14.30, SD = 1.44, $p < .01$). There was no significant difference in correct recognition-recall items between the sad mood participants and the neutral mood participants, p = ns, therefore only partially supporting the hypothesis.

Furthermore, the recognition-recall items on the questionnaire were divided into either central or peripheral items (see Table 1), based on whether the questions were regarding details relevant to the eyewitness situation presented in the video (central) or whether the questions referred to details not relevant to the eyewitness situation (peripheral). Central items and peripheral items were each analyzed using a one-way ANOVA.

A significant main effect was found regarding the central items, F (2, 77) = 3.34, $p < .05$ (see Figure 3). The angry mood participants recalled fewer central items (M = 8.67, SD = .91) than the neutral mood participants (M = 9.43, SD = 1.25, $p < .05$) and the sad mood participants (M = 9.37, SD = 1.11, $p < .05$). The sad mood participants and neutral mood participants did not significantly differ from each other (p = ns). While no main effect was found regarding peripheral items (F (2, 77) = 2.49, p = .09), planned comparisons showed a significant difference between sad mood participants and angry

Table 1

Central and Peripheral Recognition-Recall Items

Type of Item	Item
Central	
	1. Was the suspect wearing sunglasses?
	2. Did the victim have a picnic basket with her?
	3. Did the victim have a sweater with her?
	4. Did the victim seem to notice when the theft occurred?
	5. Did the suspect run away after the theft?
	11. Did the suspect speak to anyone at the park?
	12. Did the victim know other people at the park?
	13. Did the suspect have a tattoo?
	16. Did the victim eat or drink anything after arriving at the park?
	17. Was the victim pushing the little girl on the swing?
	18. Did the suspect have a goatee?
Peripheral	
	6. Was there a dog wandering on the grass?
	7. Was there a woman with a stroller nearby?
	8. Were there children playing nearby?
	9. Was during the theft the only time you saw the suspect?
	10. Were there cars passing by in the background?
	14. Was there an older woman sitting on a bench nearby?
	15. Did you see a woman pushing a child on a swing?

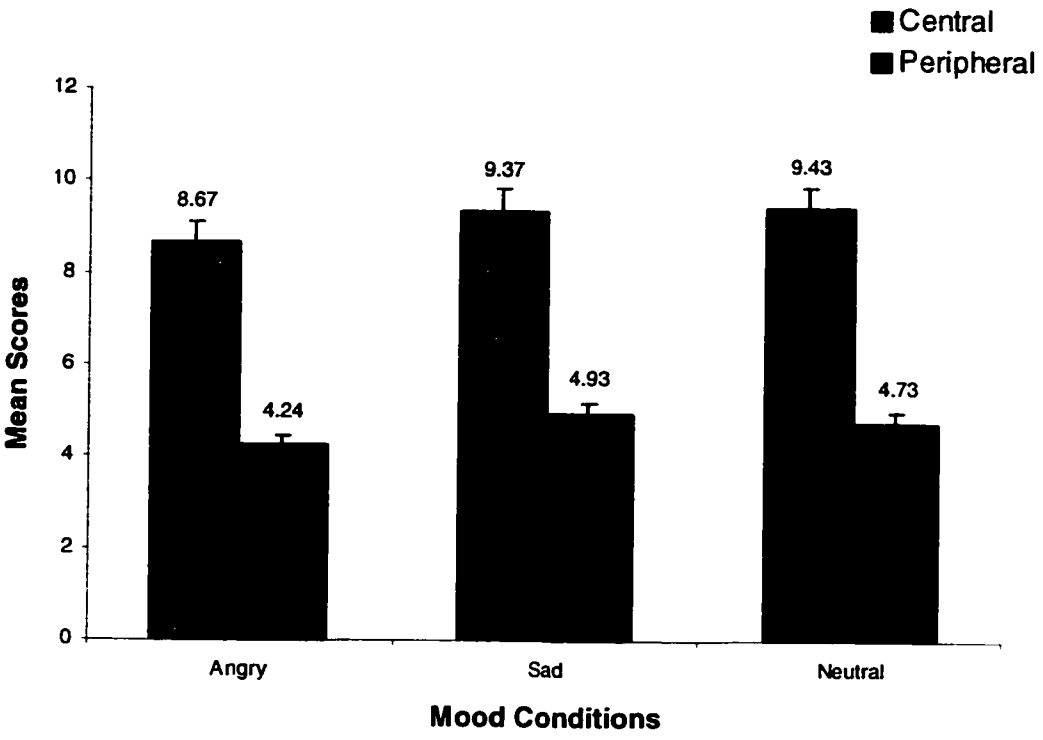

Figure 3. Central and Peripheral item Means for Angry (n = 21), Sad (n = 27), and Neutral (n = 30) Mood Conditions.

mood participants ($p < .05$). This supports the previous findings of an effect of mood condition on recognition-recall ability.

Free-recall

Once again, it was hypothesized that the neutral mood participants would recall the most items accurately, followed by the sad mood participants, and then the angry mood participants. The main effect of mood approached significance, $F(2, 77) = 2.87$, $p = .06$. Planned comparisons showed that participants in a sad mood ($M = 3.96$, $SD = 1.91$) recalled significantly more items than participants in a neutral ($M = 2.57$, $SD = 2.05$, $p < .05$) mood. The angry ($M = 3.14$, $SD = 2.71$) mood participants did not significantly differ from either the sad or neutral mood participants.

Additional analysis

Although no previous hypothesis was made, we examined the effects of gender on the measured variables. We conducted a 2 (gender) x 3 (mood: angry, sad, or neutral) ANOVA on each of the measured variables. No main effect of gender or an interaction effect with the mood condition was produced for any of the measured variables. These results show that gender did not have a direct effect or an interactive effect with the mood condition to influence recall. These results suggest that men and women react the same way when recalling details from an eyewitness event.

A chi-square test was conducted to see if there was any difference between male and female participants regarding whether the participant had ever testified as an eyewitness to a crime or accident before, $\chi^2(1, N = 78) = .96$, $p = .33$. We also ran a chi-square test to see if there was any difference between male and female participants regarding

whether the participant had ever been a victim of crime, χ^2 (1, $\underline{N}$ = 78) = .77, $\underline{p}$ = .38. No significant results were found for either chi-square test.

Discussion

The present study was conducted to examine whether the resource allocation model (Ellis & Ashbrook, 1988) could be applied to negative moods other than sadness in an eyewitness setting. According to the resource allocation model, when a person is in a negative mood, some of the attention that otherwise would be used to encode information about a situation is used instead to process information regarding the mood. Furthermore, in stressful, depressing, or highly arousing situations, there is substantial evidence that reallocation of attentional capacity takes place. Following these assumptions, anger should produce greater reallocation of attentional capacity than sadness. Thus, it was anticipated that sadness would cause more detriment to recall (cued-recall, recognition-recall, and free-recall) than the neutral condition, but that anger would cause a greater detriment to recall than sadness. The results of the present study showed that somewhat consistent with the hypothesis, mood influenced recognition-recall, primarily due to a significant difference in the number of central items recalled by each mood condition. Although free-recall was influenced somewhat by mood, the effects of mood were the opposite of the hypothesis. Finally, mood did not influence cued-recall.

The only type of recall exhibiting a significant difference between the three mood groups was recognition recall. This finding seems to be due to a difference in the number of central items remembered, with the angry mood group significantly lower than the

neutral mood and sad mood conditions. The neutral mood group recalled the most items correctly, followed by the sad mood group, and finally the angry mood group. It may be that if a deficit in recall exists, it is most prominent when examining the central items, feasibly due to central items being more noticeable than peripheral items in the first place.

Regarding the free-recall question, few additional details were recalled for all three mood conditions. A floor effect may have occurred with the free-recall items. It is possible that participants were primed for items by the cued-recall and recognition-recall parts of the questionnaire, due to these items preceding the free-recall question.

As to cued-recall, there was no difference in recall between the three mood groups. It is possible that the task was too difficult, creating a performance ceiling effect. Since the cued-recall questions were presented first on the eyewitness questionnaire, it is also possible that ambiguity in the instructions for the questionnaire left some participants unsure to which video the questionnaire referred. This may have resulted in incorrect answers being reported where correct answers may have otherwise been presented. However, this interpretation is speculative and interpreted with caution.

It seems that, at least somewhat, mood does affect recall. However, the negative mood groups (sad and angry) did not show a comprehensive recall deficit when compared to the neutral mood group. Furthermore, the angry mood participants did not perform worse than the sad and neutral mood participants regarding cued-recall and free-recall. Therefore, with the exception of recognition-recall, support for the resource allocation model (Ellis & Ashbrook, 1988) was not provided.

Overall, the present results suggest that free-recall and cued-recall were more difficult tasks than recognition-recall. It seems that the harder the recall task was, the more the results were contrary to the assumptions of the resource allocation model. Perhaps the free-recall task and the cued-recall questions were too difficult for any of the participants. This may account for the lack of supportive results concerning these types of recall.

Because eyewitness questioning consists of questions more similar to the free-recall and cued-recall items than the recognition-recall items, this may help explain why eyewitness accuracy is often so poor. Of the cued-recall items, all three groups only recalled, on average, about half of the items. This reinforces the notion that eyewitness memory is not very accurate, as a whole. Furthermore, the present results suggest that mood effects may affect the accuracy of eyewitness testimony in a courtroom, which may have great ramifications as to how we view eyewitness memory in the future.

Limitations and future research

While the present study tried to create an eyewitness experience that resembled a real-life experience as closely as possible, it did have several limitations. It is quite likely that a mood produced artificially (e.g., a videotape) will differ in several aspects (e.g., physiological, arousal level) from that created in response to real life events. Also, watching an eyewitness event take place on a television screen is very different from watching it take place in a full-scale, three-dimensional environment. Taking these issues into consideration, it is impossible to create an emotional eyewitness situation that truly

resembles a real-life event in every perspective. The present study attempted to make the eyewitness event as close to a real-life event as possible, within these restrictions.

In contrast, conducting a study in a laboratory setting was also a strength of the present study. The experimental situation allowed us to manipulate mood, which enabled us to make causal inferences regarding mood. In a real-life eyewitness situation, controlled mood manipulation would not be possible.

The mood manipulation check preceding the eyewitness questionnaire demonstrated that the various mood induction tapes (sad, angry, and neutral) succeeded in producing differing mood conditions. However, the sad and angry mood induction tapes did not seem to induce strong enough emotions to achieve the desired effect on recall for the eyewitness event. On a scale from 0 to 100, the means for these groups fell in the mid-scale range, demonstrating that the induced mood was mild. Higher mean scores would have been more desirable. Still, it seems that the moderate mood inductions did consistently last to some degree throughout the study.

One explanation for these moderate results may be the use of a scale with so many possible scores, causing too much variability to be introduced to the study. Changing the mood measurement scale to a 9-point Likert-type scale may help reduce the variability among participants. It may also give participants a more precise gauge by which to measure their feelings, potentially resulting in the reporting of higher mood scores.

Another limitation of the study is the use of the same mood measurement before and after the eyewitness questionnaire. While this is necessary in order to be able to systematically compare the participant's mood prior to and succeeding the questionnaire,

it also may intimate the true purposes behind the study to the participant. The participant may deduce that one of the real motivations of the study is to measure the participant's mood. This may introduce demand characteristics, and the results of the study may become skewed.

A final limitation of the present study was that mood was manipulated after viewing the eyewitness event. Due to this, participants may have forgotten some information regarding the event by the time they were given the recall questionnaire. However, the present study was conducted in this manner in order to simulate viewing an eyewitness event and as a result, being in a sad or angry mood. Manipulating participants' mood before viewing the eyewitness event may have better demonstrated the effects of each mood on recall, since participants would have been in the specified mood at the time of viewing the eyewitness event. At the same time, this would help reduce the length of time between viewing the eyewitness event and answering the recall questionnaire, possibly reducing information loss during this gap and increasing the potential for recall. This would allow any recall deficits to be more clearly attributed to the mood condition.

Future research should examine the effects of other negative moods (e.g., anxiety) that may be easier to induce than anger, on memory. Such investigation may provide more support for the resource allocation model. Stronger, more distinct mood induction videos should also be utilized, as well as a more precise mood measurement questionnaire (e.g., a Likert-type scale), and a larger sample population.

Also exploring the relationship between ethnicity to eyewitness recall performance and mood may provide further insight into the subject. Such investigation could provide

an important contribution toward understanding the relationship between mood and memory. Overall, mood and memory have an intricate relationship imperative of much further examination.

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Appendix A

Human Subjects-Institutional Review Board Approval Letter

San José State
UNIVERSITY

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Associate Vice President Graduate Studies and Research
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To: Jennifer Walter
589 Clearwater Court
Sunnyvale, CA 94087

From: Nabil Ibrahim,
AVP, Graduate Studies & Research

Date: November 15, 2001

The Human Subjects-Institutional Review Board has approved your request to use human subjects in the study entitled:

"Eyewitness Memory: Effects of Sadness and Anger on Recall."

This approval is contingent upon the subjects participating in your research project being appropriately protected from risk. This includes the protection of the anonymity of the subjects' identity when they participate in your research project, and with regard to any and all data that may be collected from the subjects. The approval includes continued monitoring of your research by the Board to assure that the subjects are being adequately and properly protected from such risks. If at any time a subject becomes injured or complains of injury, you must notify Nabil Ibrahim, Ph.D. immediately. Injury includes but is not limited to bodily harm, psychological trauma, and release of potentially damaging personal information. This approval for the human subjects portion of your project is in effect for one year, and data collection beyond November 14, 2002 requires an extension request.

Please also be advised that all subjects need to be fully informed and aware that their participation in your research project is voluntary, and that he or she may withdraw from the project at any time. Further, a subject's participation, refusal to participate, or withdrawal will not affect any services that the subject is receiving or will receive at the institution in which the research is being conducted.

If you have any questions, please contact me at (408) 924-2480.

Appendix B

Questionnaire

THANK YOU for your cooperation in this study. This entire questionnaire should take about 20 minutes to complete. Please answer the following questions based on the last video you watched. Indicate your response toward each question by placing a vertical mark on the line.

1. How interesting was the video?

Not at all interesting _____ Very interesting

2. What was your mood after watching the video?

Indifferent _____ Very emotional

3. How sad do you feel right now?

Not at all sad _____ Very sad

4. How memorable was the video?

Not at all memorable _____ Very memorable

5. How angry do you feel right now?

Not at all angry _____ Very angry

6. How much did you like the people/characters presented in the video?

Didn't like at all _____ Liked very much

7. How much did you like the scenario presented in the video?

Didn't like at all _____ Liked very much

8. How blue do you feel right now?

Not at all blue _____ Very blue

9. Do you think the scene presented in the video was realistic?

Not at all realistic — Definitely realistic

10. How thought provoking was the video?

Not at all thought provoking — Very thought provoking

11. How mad do you feel right now?

Not at all mad — Very mad

12. What is your general mood right now?

Very bad — Very good

QUESTIONNAIRE

For the questions below, write your answers on the line next to each question. Please take your time and answer the questions as accurately as possible. Try to answer every question, even if you are not completely sure of the answer.

(**NOTE**: "***Suspect***" refers to the person who committed the crime. "***Victim***" refers to the person to whom
the crime was committed against.)

1. What ethnicity/race do you think the suspect is?_____

2. How tall do you think the suspect is? (answer in feet and inches) _____

3. What do you think the suspect weighs? (answer in pounds) _____

4. What color hair did the suspect have? _____

5. What color shirt was the suspect wearing? _____

6. What color pants was the suspect wearing? _____

7. How old do you think the suspect is? (answer in years) _____

8. What ethnicity/race do you think the victim is? _____

9. What item was stolen from the victim? _____

10. What color was the item stolen from the victim? _____

11. With which hand did the suspect grab the item? _____

12. Where was the item when it was stolen? _____

13. Where was the victim when the item was stolen? _____

14. How many children were on the swings right before the theft occurred? _____

15. What color(s) was the picnic blanket that was spread out on the table? _____

16. What color was the dress of the little girl accompanying the victim? _____

17. What type of clothing was the victim wearing? _____

For this section, circle either "yes" or "no" to answer each question. Please take your time and answer the questions as accurately as possible. Try to answer every question, even if you are not completely sure of the answer.

1. Was the suspect wearing sunglasses?	**yes**	**no**
2. Did the victim have a picnic basket with her?	**yes**	**no**
3. Did the victim have a sweater with her?	**yes**	**no**
4. Did the victim seem to notice when the theft occurred?	**yes**	**no**
5. Did the suspect run away after the theft?	**yes**	**no**
6. Was there a dog wandering on the grass?	**yes**	**no**
7. Was there a woman with a stroller nearby?	**yes**	**no**
8. Were there children playing nearby?	**yes**	**no**
9. Was during the theft the only time you saw the suspect?	**yes**	**no**
10. Were there cars passing by in the background?	**yes**	**no**
11. Did the suspect speak to anyone at the park?	**yes**	**no**
12. Did the victim know other people at the park?	**yes**	**no**
13. Did the suspect have a tattoo?	**yes**	**no**
14. Was there an older woman sitting on a bench nearby?	**yes**	**no**
15. Did you see a woman pushing a child on a swing?	**yes**	**no**
16. Did the victim eat or drink anything after arriving at the park?	**yes**	**no**
17. Was the victim pushing the little girl on the swing?	**yes**	**no**
18. Did the suspect have a goatee?	**yes**	**no**

For the section below, please write down anything else (other details of the event) you can remember.

The following is a series of questions about yourself and your background. Please read each question carefully and check or fill-in the response that most closely reflects your current status. Please answer the items honestly and accurately. Your responses will remain anonymous and confidential.

WHAT IS YOUR AGE? _____

GENDER: ☐ Male ☐ Female

ETHNICITY: ☐ Asian ☐ Pacific Islander ☐ Mexican American

☐ Black/ African American ☐ Native American ☐ Middle Eastern

☐ White/ Caucasian ☐ Hispanic ☐ Other

WHAT YEAR ARE YOU IN SCHOOL?

☐ Freshman ☐ Sophomore ☐ Junior ☐ Senior

☐ Graduate Student ☐ Other (Please specify) _____

MARITAL STATUS:

☐ Single ☐ Separated ☐ Divorced

☐ Married ☐ Widowed ☐ Living with significant other

OCCUPATION: _____

WHAT IS YOUR MAJOR?_____

HAVE YOU EVER TESTIFIED AS AN EYEWITNESS TO A CRIME OR ACCIDENT BEFORE?

☐ Yes ☐ No

HAVE YOU EVER BEEN A VICTIM OF A CRIME?

☐ Yes ☐ No

Please answer the following questions based on the last video you watched. Indicate your response toward each question by placing a vertical mark on the line.

1. How interesting was the video?

Not at all interesting _____ Very interesting

2. What was your mood after watching the video?

Indifferent _____ Very emotional

3. How sad do you feel right now?

Not at all sad _____ Very sad

4. How memorable was the video?

Not at all memorable _____ Very memorable

5. How angry do you feel right now?

Not at all angry _____ Very angry

6. How much did you like the people/characters presented in the video?

Didn't like at all _____ Liked very much

7. How much did you like the scenario presented in the video?

Didn't like at all _____ Liked very much

8. How blue do you feel right now?

Not at all blue _____ Very blue

9. Do you think the scene presented in the video was realistic?

Not at all realistic — Definitely realistic

10. How thought provoking was the video?

Not at all thought provoking — Very thought provoking

11. How mad do you feel right now?

Not at all mad — Very mad

12. What is your general mood right now?

Very bad — Very good

THIS CONCLUDES THE QUESTIONNAIRE. THANK YOU VERY MUCH FOR YOUR PARTICIPATION.

Appendix C

Consent Form signed by Participants

San José State
UNIVERSITY

College of Social Sciences
Department of Psychology
One Washington Square
San José, CA 95192-0120
Voice: 408-924-5600
Fax: 408-924-5605
E-mail: psych@email.sjsu.edu

CONSENT FORM

This study is being conducted by Jennifer Walter, a Graduate Student at the Department of Psychology at San Jose State University. You have been asked to participate in a research study investigating social interactions and perceptions. If you agree to participate in the study, you will be asked to view videos and complete a questionnaire. This study will take you less than an hour to complete.

Participation in this study is on a voluntary basis; therefore, you have the right to withdraw your participation at any point in time. No benefit of any kind, to which you are otherwise entitled, will be lost or jeopardized if you choose not to participate. If you decide to participate in the study, you are free to withdraw at any time without any negative effect on your relations with San Jose State University.

All of your responses to the questionnaires will be completely anonymous. In addition, the data from the study will be reported as group totals; no individual responses will ever be identified. There are no anticipated risks involved in the study; probability and magnitude of harm or discomfort are no greater than encountered in daily life. No discernible benefits to participants are expected.

Upon completion of the study, you will be given an explanation of the research and allowed to ask questions regarding the study. If you have additional questions concerning the study or the results of the study, you may contact Jennifer Walter at the Department of Psychology (408-924-5600). Complaints about the research may be presented to Dr. Robert Pellegrini, Chairperson, Department of Psychology (408-924-5600). Questions or complaint about research, participants' rights, or research-based injury may be presented to Dr. Nabil Ibrahim, Associate Academic Vice President for Graduate Studies and Research (408-924-2480).

Please sign below to indicate your voluntary consent to participate. Thank you very much. At the time that you sign this consent form, you will receive a copy of it for your records, signed and dated by the investigator.

Your Signature _____ Date _____

Investigator's Signature _____ Date _____

Appendix D

Debriefing Statement given to Participants at Completion of Study

DEBRIEFING

This debriefing concerns the study in which you have just participated. We conducted this study in order to examine eyewitness memory. Specifically, we are examining how different moods affect memory recall from an eyewitness event. Theoretically, sad moods are supposed to cause interference that is responsible for poorer recall from memory. This is due to a preoccupation with the sad mood, which allows less allocation of mental resources to other tasks. Since it is believed that there is a limited capacity of mental ability, this interference diverts cognitive effort away from the new task (in this case, viewing an eyewitness event) that would otherwise have been available for processing the new information. In the present study, this theory is being extended to angry moods to see if the same interference results will be found.

There were actually three different experimental conditions (sad mood, angry mood, and neutral mood). You were exposed to only one of these three conditions. We believe that this investigation is important, given that so much weight is placed on eyewitness testimony in court. If different moods affect recall, this could have an impact on the credibility given eyewitness testimony and/or the way it is handled in court.

If you have any questions or any concerns about anything to do with this study, please feel free to contact Jennifer Walter at (408) 924-5600. If you continue to feel the effects of the mood induction and would like to seek counseling, information is attached regarding on-campus resources. We wish to extent our deepest appreciation for your participation in this study.

Counseling Services

Counseling Services offers psychological individual and couples' counseling to matriculated SJSU students at no cost. If you would like to schedule an appointment, please call us at (408) 924-5910, Mondays through Fridays from 9am to 4pm. We are located in the Administration Building, Room 201.

Individual Counseling

Individual counseling facilitates the exploration and resolution of personal problems and issues according to the needs of the individual. Some of the issues often addressed in individual counseling are:

Depression
Anxiety
Loneliness
Difficulty forming and maintaining healthy relationships
Dealing with physical or emotional abuse (past or present)
Cross-cultural issues (including cultural conflicts between parents & child)
Difficulty defining problems
Marked changes in functioning
Irritability
Changes in thinking or perceptual abilities
Self-esteem
Problematic behavior
Difficulty setting limits with others

Depending on the availability of both the student and counselors, regular counselors in Counseling Services can offer up to six sessions of confidential personal counseling per semester. Interns and trainees may be able to see clients for a longer period of time.